BIOLOGY

BOOKS - MODERN PUBLISHERS BIOLOGY (HINGLISH)

MOLECULAR BASIS OF INHERITANCE

Practice Problems

1. What is S-strain of Diplococcus?

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2. What is coil of life ?

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3. What is positive super coil?

Watch Video Solution

4. How positive super coils are released?

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5. What is semi-discontinuous replication?

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6. What is R-strain of Diplococcus?

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7. What are isoacceptor t-RNAs?

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8. Draw a well labelled diagram of rRNA?

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9. Draw a schematic diagram of RNA(clover leaf model)?

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10. Draw a L-from model of tRNA?

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Practice Problems Dna As Genetic Material

1. What is repetitive DNA?

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2. What is unique DNA?

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3. Define promiscous DNA?

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4. How many types of replication is observed in DNA?

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5. Write about contribution of Har Gobind Khorana in the field of Genetics?

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6. What is Wobble hypothesis?

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7. Describe briefly about RNA polymerase I, RNA polymerase II and RNA polymerase III?

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8. Which organic molecule, other than proteins, act as biocatalysts?

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9. Diferentiate between initiation codons and termination condons?

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10. Give the diagrammatic presentation of three concepts of transcriptional information from DNA?

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Practice Problems Gene Regulation

1. How does reproduction occur in single stranded DNA phages?

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2. For which two reasons, the operon model is likely to be revised?

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3. Differentiate between aporepressor and co repressor?

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4. What are main kinds of reproduction in viruses? Gives examples.

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5. What is reverse transcription?

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6. The genes and polypeptides it codes are said are to be collinear. Explain?

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Ncert File Ncert Exercise Questions

1. Group the following as nitrogenous bases and nucleosides:

Adenine, Cytidine, Thymine, Guanosine, Uracil and Cytosine.

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2. If a double stranded DNA has 20% of cytosines, calculate the percent of adenine in the DNA.

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3. If the sequence of one strand of DNA is written as follows :

5' ATGC ATGC ATGC ATGC ATGC ATGC ATGC 3' Write down, the sequence of complementary strand in 3' $\rightarrow$ 5' direction.

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4. If the sequence of coding strand in a transcription unit is written as follows :

5' -ATGCATGCATGCATGCATGCATGCATGC-3'

Write down the sequence of mRNA.

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5. Which property of DNA double helix led Watson and Crick to hypothesise semiconservative mode of DNA replication? Explain.

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6. Depending upon chemical nature of template (DNA or RNA) and the nature of nucleic acids synthesized from it (DNA or RNA), list the types of nucleic acid polymerases.

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7. How did Hershey and Chase differentiate between DNA and protein in their experiment while proving that DNA is the genetic material?

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8. Differentiate between the followings:

(a) Repetitive DNA and Satellite DNA

(b) mRNA and tRNA

(c) Template strand and Coding strand

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9. List two essential roles of ribosome during translation.

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10. In the medium where E. coli was growing, lactose was added, which induced the lac operon. Then, why does lac operon shut down some time

after addition of lactose in the medium?

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11. Explain (in one or two lines) the function of the followings:

(a) Promoter

(b) tRNA

(c) Exons

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12. Why is the Human Genome project called a mega project?

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13. What is DNA fingerprinting? Mention its application.

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14. Briefly describe the following:

(a) Transcription

(b) Polymorphism

(c) Translation

(d) Bioinformatics

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Ncert File Ncert Exemplar Problems Multiple Choice Questions

1. In a DNA strand the nucleotides are linked together by

A. Glycosidic bonds

B. Phosphodiester bonds

C. Peptide bonds

D. Hydrogen bonds

Answer: B

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2. A nucleoside differs from a nucleotide. It lacks the

A. Base

B. Sugar

C. Phosphate group

D. Hydroxyl group

Answer: C

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3. Both deoxyribose and ribose belong to a class of sugars called

A. Trioses

B. Hexoses

C. Pentoses

D. Polysaccharides

Answer: C

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4. The fact that a purine base always paired through hydrogen bonds with a pyrimidine base leads to, in the DNA double helix

A. The antiparallel nature

B. The semiconservative nature

C. Uniform width throughout DNA

D. Uniform length in all DNA

Answer: C

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5. The net electric charge on DNA and histones is

A. Both positive

B. Both negative

C. Negative and positive, respectively

D. Zero

Answer: C

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6. The promoter site and the terminator site for transcription are located at

A. 3' (downstream) end and 5’ (upstream) end, respectively of the transcription unit.

B. 5' (upstream) and 3' (downstream) end, respectively of the transcription unit

C. The 5' (upstream) end

D. The 3' (downstream) end

Answer: C

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7. Which of the following statements is the most appropriate for sickle cell anaemia

A. It cannot be treated with iron supplements

B. It is a molecular disease

C. It confers resistance to acquiring malaria

D. All of the above

Answer: D

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8. One of the following is true with respect to AUG:

A. It codes for methionine only

B. It is also an initiation codon

C. It codes for methionine in both prokaryotes and eukaryotes

D. All of the above

Answer: D

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9. The first genetic material could be

A. Protein

B. Carbohydrates

C. DNA

D. RNA

Answer: D

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10. With regard to mature mRNA in eukaryotes

A. Exons and introns do not appear in the mature RNA

B. Exons appear but introns do not appear in the mature RNA

C. Introns appear but exons do not appear in the mature RNA

D. Both exons and introns appear in the mature RNA

Answer: B

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11. The human chromosomes with the highest and least number of genes in them are respectively :

A. Chromosome 21 and Y

B. Chromosome 1 and X

C. Chromosome 1 and Y

D. Chromosome X and Y

Answer: A

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12. Who amongst the following scientists had no contribution in the development of the double helix model for the structure of DNA

A. Rosalind Franklin

B. Maurice Wilkins

C. Erwin Chargaff

D. Meselson and Stahl

Answer: D

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13. DNA is a polymer of nucleotides which are linked to each other by $3' - 5'$ phosphodiester bond . To prevent polymerisation of nucleotides, which of the following modifications would you choose ?

A. Replace purine with pyrimidines

B. Remove/Replace 3' OH group in deoxyribose

C. Remove/Replace 2' OH group with some other group in deoxyribose

D. Both 'B' and 'C'.

Answer: B

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14. Discontinuous synthesis of DNA occurs in one strand, because

A. DNA molecule being synthesised is very long

B. DNA dependent DNA polymerase catalyses polymerisation only in one direction (5' $\rightarrow$ 3')

C. It is a more efficient process

D. DNA ligase has to have a role

Answer: B

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15. Which of the following steps in transcription is catalysed by RNA polymerase?

A. Initiation

B. Elongation

C. Translation

D. None of the above

Answer: B

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16. Control of gene experssion takes place at the level of

A. DNA-replication

B. Trancription

C. Translation

D. None of the above

Answer: B

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17. Regulatory proteins are the accessory proteins that interact with RNA polymerase and affect its role in transcription. Which of the following statements is correct about regulatory protein ?

A. They only increase expression

B. They only decrease expression

C. They interact with RNA polymerase but do not affect the expression

D. They can act both as activators and as repressors

Answer: D

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18. Which was the last human chromosome to be completely sequenced ?

A. Chromosome 1

B. Chromosome 11

C. Chromosome 21

D. Chromosome X

Answer: A

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19. Which of the following are the functions of RNA

A. It is a carrier of genetic information from DNA to ribosomes synthesising polypeptides

B. It carrier amino acids to ribosomes

C. It is a constituent component of ribosomes

D. All of the above

Answer: D

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20. While analysing the DNA of an organism a total number of 5386 nucleotides were found out of which the proportion of different bases were: Adenine=29 %, Guanine= 17%, Cytosine=32%, Thymine=17 %, Considering the Chargaff's rule it can be concluded that

A. It is a double stranded circular DNA

B. It is single strandedDNA

C. It is a double stranded linear DNA

D. No conclusion can be drawn

Answer: A

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21. In some viruses, DNA is synthesised by using RNA as template, Such a DNA is called

A. A-DNA

B. B-DNA

C. c-DNA

D. r-DNA

Answer: C

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22. If Meselson and Stahl's experiment is continued for four generations in bacteria, the ratio of $^{15}N/^{15}N:^{15}N/:^{14}/^{14}N$ containing DNA in the fourth generation would be

A. $1:1:0$

B. $1:4:0$

C. $0:1:3$

D. $0:1:7$

Answer: D

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23. If the sequence of nitrogen bases of the coding strand of DNA in a transcription unit is $5' - ATGAATG - 3'$, the sequence of bases in its RNA transcript would be

A. 5' - A U G A A U G -3'

B. 5' - U A C U U A C - 3'

C. 5' - C A U U C A U - 3'

D. 5'- G U A A G U A - 3'

Answer: A

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24. The RNA polymerase holoenzyme transcribes

A. The promoter, structural gene and the terminator region

B. The promoter, and the terminator regions

C. The structural gene and the terminator regions

D. The structural gene only

Answer: C

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25. If the base sequence of a codon in mRNA is $5' - AUG - 3'$, the sequence of tRNA pairing with it must be

A. 5'-UAC-3'

B. 5'-CAU-3'

C. 5'-AUG-3'

D. 5'-GUA-3'

Answer: B

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26. The amino acid attaches to the tRNA at its

A. 5' - end

B. 3' - end

C. Anticodon site

D. DHU loop

Answer: B

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27. To initiate translation, the mRNA first binds to

A. The smaller ribosomal sub-unit

B. The larger ribosomal sub-unit

C. The whole ribosome

D. No such specificity exists.

Answer: A

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28. In E.coli, the lac operon gets switched on when :

A. Lactose is present and it binds to the repressor

B. Repressor binds to operator

C. RNA polymerase binds to the operator

D. Lactose is present and it binds to RNA polymerase

Answer: A

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Ncert File Ncert Exemplar Problems Very Short Answer Type Questions

1. What is the function of histones in DNA packaging ?

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2. Distinguish between heterochromatin and euchromatin. Which of the two is transcriptionally active?

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3. The enzyme DNA polymerase in E. coli is a DNA dependent polymerase and also has the ability to proofread the DNA strand being synthesised Explain. Discuss the dual polymerase.

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4. What is the cause of discontinuous synthesis of DNA on one of the parental strands of DNA? What happens ro these short stretches of synthesised DNA?

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5. Given below is the sequence of coding strand of DNA in a transcription unit 3' AATGCAGCTAT TAGG-5' Write the sequence of

(a) its complementary strand

(b) the mRNA

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6. What is DNA polymorphism? What is it important to study it?

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7. Based on your understanding of genetic code, explain the formation of any abnormal heamoglobin molecule. What are the known consequences of such a change?

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8. Sometimes cattle or even humen beings give birth to their young ones that are having extremely different sets of organs like limba/position of eye(s) etc. Comment .

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9. In a nucleus, the number of ribonucleoside triphophates is 10 times the number of deoxy $\times 10$ ribonucleoside triphosphaes, but only deoxy ribonucleotides are added during the DNA replication. Suggest a mechanism.

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10. Name a few enzymes involed in DNA replication other then DNA polymerase and ligase. Name the Key function for each of them.

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11. Name any three viruses which have RNA as the genetic material.

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Ncert File Ncert Exemplar Problems Short Answer Type Questions

1. Define transformation in Griffith's experiment. Discuss how it helps in the identifications of DNA as genetic material

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2. Who revealed the biochemical nature of the transforming principle? How was it done?

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3. Discuss the singnificance of heavy isotope of nitrogen in the Meselson and Stahl's experiment .

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4. Define a cistron . Giving examples differentiate between monocistronc and polycistronic unit.

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5. Give any six features of the humen genome.

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6. During DNA replication, why is it that the entire molecule does not open in one go? Explain replication fork. What are the two functions that the monomers (dNTPs) play ?

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7. Retroviruses do no follow central dogma. Comment.

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8. In an experiment, DNA is treated with the compound which tends tol place itself amongst the stacks of nitrogenous base pairs. As a result of this, the distance between two consecutive base increases .From 0.34-0.44nm calculate the length of DNA double helix (Which has `2xx10^(9)bp) in the presence of saturating of this compound.

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9. What would happen if histones were to be mutated and made rich in acidic amino acids such as aspertic acid and gultamic acid in place of basic amino acids such as lysine and arginine?

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10. Recell the experiments done by frederick Griffith, Avery, MacLeod and McCarty, where DNA was speculated to be the genatic material. If RNA , instead of DNA was the genetic meterial, would the heat killed strain of pneumoccus have transformed the R-strain into virulent strani? Explain.

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11. You are repeating the Hershey-Chase experiment and are provided with two isotopes $.^{32}P$ and $.^{15}N$(in place of $.^{35}S$ in the original experiment). How does yoe expect your results to be differnet?

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12. There is only one possible sequence of amino acids when deduced from a given nucleotides. But multiple nucleotides sequence can be deduced from a single amino acid sequence. Explain this phenomena.

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13. A single base mutation in a gene may not 'always' result in loss or gain of function. Do you think the statement is correct? Defined your answer .

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14. A low level of expression of lac operon occurs at all the time. Can you explain the logic behind this phenomena.

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15. How has the sequencing of humen genome opened new windows for treatment of verious genetic disorders. Discuss amongst your classmates.

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16. The total number of genes in humans is far less(lt25000) the than the pravious estimate (up to 140000 gene). Comment.

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17. Now , sequencing of total genomes is getting less expensive day by day. Soon it may be affordable for a common men to get his genome sequenced. What in your opinion could be the advantage and disadvantage of this development?

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18. Would it be appropriate to use DNA probes such as VNTR in DNA fingerprinting of a bacteriophage?

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19. During in vitro synthesis of DNA, a researcher used 2'-3'—dideoxycytidine triphosphate as raw nucleotide in place of 2'-deoxy cytidine triphosphate other conditions remaining as standard. Will further polymerisation of DNA continue upto the end or not? Explain.

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20. That background information did Watson and Crick have made available for developing a model of DNA ? What was their contribution ?

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21. What are the functions of

(i) methylated guanine cap?

(ii) poly-A 'tail' in a mature on RNA ?

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22. Do you think that the alternate splicing of exons may enable a structural gene to code for several isoprotains from one and the same gene? If yes, how? If not, why so ?

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23. Comment on the utility of variability in number of tansem repeats during DNA fingerprinting .

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Ncert File Ncert Exemplar Problems Long Answer Types Questions

1. Give an account of Hershey and Chase experimant. What did it conclusively prove? If both DNA and protenis contained phosphors and sulphur do you think the result would have been the same?

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2. During the course f evolution why DNA was choosen over RNA as genetic material. Give reasons by first discussing the desired criteria in a molecule that can act as genetic meterial and in the light of biochemical differences between DNA and RNA .

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3. Give an account of post transcriptional modifications of a eukaryotic mRNA.

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4. Discuss the process of translation in detail.

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5. Define an operon, giving an example, explain an inducible operon.

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6. There is a paternity dispute for a child'. Which techique can solve the problem? Discuss the priciple involved.

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7. Give an account of the methods used in sequencing the humen genome.

Watch Video Solution

8. List the various markers that are used in DNA fingerprinting

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Hots Very Short Answer Questions

1. What is transcription ?

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2. What are called Okazaki fragments ?

Watch Video Solution

3. Write any two functions of DNA

Watch Video Solution

4. Expand VNTR

Watch Video Solution

5. Name the chromosomes which have most and fewest genes.

Watch Video Solution

6. Expand BAC and YAC.

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Hots Short Answer Questions

1. Write the full form of t-RNA.

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2. Distinguish between bacterial transformation and transduction.

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3. Mention the two steps in activation of amino acid translation.

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4. Three codons on m-RNA are not recognised by t-RNA. What do we call them?

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5. Explain briefly what is meant by DNA $\rightarrow$ RNA $\rightarrow$ protein

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6. AUG GAC CUG AUA UUU UGA is the base sequence in a strand of m-RNA.

(i) Write the base sequence of the DNA strand from which it has been transcribed.

(ii) Upon translation, how many amino acids will be the resulting peptide have?

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7. What is genetic variability? Name any two sources of variation in a gene pool.

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8. Why is DNA considered better and predominant genetic material than RNA?

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9. Differentiate between mRNA and tRNA.

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Hots Long Answer Questions

1. The process of DNA replication is :

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2. Define bacterial transformation who demonstrated it experimentally and how?

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3. The process of DNA replication is :

Watch Video Solution

4. How does operon work in bacteria?

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Quick Memory Test Say True Or False

1. Transfer RNA is present in the cytoplasm and help in bringing activated amino acids to ribosomes.

Watch Video Solution

2. The hydrolysis of GTP provide energy during initiation, elongation and termination of peptide chain.

Watch Video Solution

3. The central dogma in molecular biology involves DNA $\rightarrow$ RNA $\rightarrow$ Proteins.

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4. Beadle and Tatum proposed one gene-one polypeptide hypothesis.

Watch Video Solution

5. UAA, GAG, UGA and AUG are non-sense codon and signal the termination of polypeptide chain.

Watch Video Solution

6. Leading strand is a replicated strand of DNA which grows continuously without any gap in 5 $\rightarrow$ 3' direction.

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7. Nirenberg was the first to carry out DNA synthesis in vitro.

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8. The ratio of A + T/G + C is constant for a species. Restriction enzymes will cut only at a specific DNA sequence.

Watch Video Solution

9. Viruses are enclosed in a protein coat referred to as capsid.

Watch Video Solution

10. The process by which totipotent embryonic cells are converted into specialized cells constituting and giving specific tissues termed determination or differentiation.

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11. Operator gene is the site or gene for binding RNA polymerase in an Operon.

Watch Video Solution

12. Wobble hypothesis proposes that the first two nucleotides of a triplet code specify an amino acid.

Watch Video Solution

13. DNA polymerase can polymerise the nucleotides in the 3' $\rightarrow$ 5' direction.

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Quick Memory Test Complete The Missing Links

1. ..... is the technique by which the three-dimensional structures of macromolecules can be studied.

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2. The DNA molecule takes a complete turn after every ..... base pairs.

Watch Video Solution

3. A nucleotide consists of a ..... ,a ..... and a nitrogen base.

Watch Video Solution

4. The experiment on DNA using ^{15}N isotope proved that its replication is ..... .

Watch Video Solution

5. ..... are enzymes that unwind DNA helices while ..... break and reseal the strands.

Watch Video Solution

6. New strands of DNA are formed only in the ..... direction.

Watch Video Solution

7. The unidirectional flow of genetic information from DNA $\rightarrow$ RNA $\rightarrow$ protein is referred to as the ..... in molecular biology.

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8. .... is the process in which information is carried from RNA to DNA in some viruses.

Watch Video Solution

9. A sequence of three nitrogen bases that code for an amino acid is a .....

Watch Video Solution

10. ..... is a segment of DNA strand on which a new strand is produced.

Watch Video Solution

11. One gene-one enzyme concept is now more accurately referred to as one ..... one ..... concept.

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12. ..... in RNA replaces thymine in DNA.

Watch Video Solution

13. ..... has the shape of clover-leaf.

Watch Video Solution

14. The formation of a peptide bond is catalysed by the enzyme ..... .

Watch Video Solution

15. Genes that shuffle from one location to another are called ....

Watch Video Solution

16. One gene-one enzyme hypothesis has been changed to ..... .

Watch Video Solution

17. Viruses ate ..... obligate parasites.

Watch Video Solution

18. The genes and polypeptide codes are for collinear was proved by .....-

Watch Video Solution

19. Phages infect the ..... cells.

Watch Video Solution

20. The protein coat of virus is called .....

Watch Video Solution

21. ..... are arranged in linear order on chromosomes.

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22. In bacteria, regulation of gene expression is usually affected through ..... .

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23. ..... is the phenomenon by which the synthesis of a set of enzymes leading to a product is shut down, when the product is provided from outside.

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Quick Memory Test Choose The Correct Alternative

1. Transfer RNA is also known as soluble RNA/ribosomal RNA.

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2. When S-type/R-type of Diplococcus is injected into mouse, the mouse will die.

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3. The process of formation of m-RNA from DNA is called translation/transcription.

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4. Some amino acids are coded by more than one codon, hence code is degenerate/unambigous.

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5. The VNTR belongs to a class of satellite DNA/satellite RNA.

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Revision Exercises Multiple Choice Questions

1. In incomplete dominance, ratio of Red : Pink : White is :

A. $1:2:1$

B. $1:1:2$

C. $1:2:2$

D. $2:2:1$

Answer: A

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2. Which enzyme is used in transcription?

A. Amino acid synthetase

B. DNA polymerase II

C. RNA polymerase

D. DNA ligase

Answer: C

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3. Non-genetic sex determination is found in :

A. Fruitfly

B. Bonellia

C. Cow

D. Birds

Answer: B

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4. Which one of the following scientist's name is correctly mathce dwith the theory put forth by him?

A. De Vries - Natural selection

B. Mendel - Theory of Pangenesis

C. Weismann - Theory of continuity of germplasm

D. Pasteur - Inheritance of acquired characters

Answer: C

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5. In the DNA molecule :

A. Proportion of adenine in relation to thymine varies with organism

B. There are two strands which run antiparallel — one in 5'-3' direction and other in 3'-5' direction

C. The total amount of purine nucleotides and pyrimidine nucleotides is not always equal

D. There are two strands which run parallel in the 5'-3' direction

Answer: B

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6. Which one of the following pairs of codons is correctly matched with their function or the signal for the particular amino acid ?

A. AUG, ACG - start/methionine

B. UUA, UCA - leucine

C. GUU, GCU - alanine

D. UAG, UGA - stop

Answer: D

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7. Which one of the following pairs of nitrogenous bases of nucleic acids is wrongly matched with category mentioned against it?

A. Guanine, adenine — purines

B. Adenine, thymine — purines

C. Thymine, uracil — pyrimidines

D. Uracil, cytosine — pyrimidines

Answer: B

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8. what is antisense technology

A. When a piece of RNA that is complementary in sequence is used to stop expression of specific gene

B. RNA polymerase producing DNA

C. A cell displaying a foreign antigen used for synthesis of antigenes

D. Production of somaclonal variants in tissue culture

Answer: A

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9. According to Chargaff's rule, which one is correct?

A. [A] + [T] = [G] + [C]

B. [A] + [C] = [G] + [T]

C. [A]+[G}=[T]+[C]

D. Both (a) and (c)

Answer: C

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10. In humans, height shows a lot of variation. It is an example of

A. Multiple alleles

B. Pleiotropic inheritance

C. Polygenic inheritance

D. Pseudoalleles

Answer: C

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11. Nucleotide arrangement in DNA can be seen by

A. X-ray crystallography

B. Electron microscope

C. Ultra centrifuge

D. Transcriptase

Answer: A

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12. Phages that show lysogenic sycle are called

A. Lytic phages

B. Temperate phages

C. Virulent phages

D. Avirulent phages

Answer: B

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13. Which one of the following is not important for evolution

A. Mutation

B. Recombination

C. Genetic drift

D. Somatic variation

Answer: D

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14. DNA has genetic properties was revealed for the first time by :

A. Griffith

B. Avery

C. Wilkins

D. Chargaff

Answer: B

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15. Process used by Meselson and Stahl for studying semiconservative replication of DNA was

A. Centrifugation

B. Chromatography

C. Density gradient centrifugation

D. Buoyant density centrifugation

Answer: C

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16. DNA was first discovered by-

A. J.D. Watson

B. Francis Crick

C. Friedrich-Miescher

D. H.G. Khurana

Answer: C

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17. Uracil is present in RNA at the place of :

A. Adenine

B. Guanine

C. Cytosine

D. Thymine

Answer: D

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18. Copying genetic information from one strand of DNA into RNA is :

A. Translation

B. Transcription

C. Transformation

D. Transduction

Answer: B

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19. The portion of DNA which contains information for an entire polypeptide is called :

A. Cistron

B. Muton

C. Recon

D. Operon

Answer: A

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20. Initiation codon for methionine is :

A. AAA

B. UUU

C. UAA

D. AUG

Answer: D

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21. Repressor protein is produced by :

A. Regulator gene

B. Operator gene

C. Structural gene

D. Promotor gene

Answer: A

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22. Retrovirus have genetic material :-

A. DNA only

B. RNA only

C. DNA or RNA only

D. Either DNA or RNA only

Answer: B

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23. DNA replication includes :

A. DNA ligase

B. DNA polymerase and ligase

C. RNA polymerase

D. All of the above

Answer: D

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Revision Exercises Very Short Answer Type Questions

1. What is a codon ?

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2. What is cistron?

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3. What is the role of t-RNA in protein synthesis?

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4. _____ are the enzymes used for cutting the DNA molecule into fragments. An example for this type of enzyme is Eco RI. What does Eco, R and 1 stand for ?

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5. Define mutation.

Watch Video Solution

6. Expand DNA and RNA.

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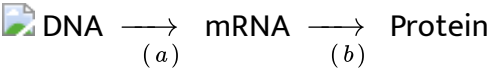
7. The flow of genetic information is shown below. Name the process of (a) and (b).



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8. Which pyrimidine base is found in RNA?

A. Cytosine

B. Adenine

C. Guanine

D. None of these

Answer:

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9. What is point mutation? Give one example.

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10. In DNA adenine and thymine are paired with how many hydrogen bonds ?

A. One

B. Two

C. Three

D. Four

Answer: B

Watch Video Solution

11. Formation of mRNA from DNA is called

A. Transcription

B. Translation

C. Replication

D. Duplication

Answer: A

Watch Video Solution

12. What are Okazaki Fragments?

Watch Video Solution

13. The type of RNA which is required for translation process is:

A. m-RNA

B. t-RNA

C. r-RNA

D. All of these.

Answer:

Watch Video Solution

14. Write the name of enzyme which join the Okazaki fragments.

Watch Video Solution

15. Define Cistron.

Watch Video Solution

16. Sequences of base pairs in DNA that reads the same on both the strands when the orientation of reading is kept the same are called sequences.

Watch Video Solution

17. The Central Dogma in Molecular Biology involves: DNA $\rightarrow$ RNA $\rightarrow$ Protein. (True/ False)

Watch Video Solution

18. Which of the following combinations do not apply to DNA?

A. Deoxyribose, Guanine

B. Ribose, Adenine

C. Deoxyribose, Uracil

D. Guanine, Thymine

Answer:

Watch Video Solution

19. What is the function of DNA-ligase?

Watch Video Solution

20. Which one of the following does not follow the central dogma of molecular biology

A. Pea

B. Mucor

C. Chlamydomonas

D. HIV

Answer: D

Watch Video Solution

21. A double stranded DNA has 20 % cytosine. What will be the percentage of thiamine in it?

A. 0.2

B. 0.4

C. 0.3

D. 0.1

Answer: C

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22. How many pairs of autosomal chromosomes are present in humans?

A. 44

B. 46

C. 22

D. 23

Answer: C

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23. Name the scientist who coined the term linkage.

Watch Video Solution

24. Self duplication property of DNA is:

A. Replication

B. Oncogenesis

C. Transcription

D. Terminism

Answer: A

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25. Transcription starts at:

A. Terminator region

B. Anywhere on DNA

C. Intron

D. Promoter region

Answer: C

Watch Video Solution

26. The enzyme that can join DNA fragments are:

A. Exopeptidases

B. Ligases

C. Endonucleases

D. Topoisomerases

Answer: B

Watch Video Solution

Revision Exercises Short Answer Type I Questions

1. Mention the polarity of the DNA strands a-b and c-d shown in the replicating fork below :

View Text Solution

2. Name the parts 'A' and 'B' of the transcription unit given below :

View Text Solution

3. Why hnRNA is required to undergo splicing?

Watch Video Solution

4. Name the enzyme and state its property that is responsible for continuous and discontinous replication of the two strands of a DNA molecule.

Watch Video Solution

5. DNA is more suitable genetic material over RNA. Why?

Watch Video Solution

6. Write the dual purpose served by deoxyribonucleoside triphosphates in ploymerisation.

Watch Video Solution

7. Differentiate between leading strand and lagging strand.

Watch Video Solution

8. Define Okazaki fragments.

Watch Video Solution

9. List two characteristics of genetic code.

Watch Video Solution

10. Results of famous experiment given in the figure. Answer the question:

(a) Identify the experiment.

(b) Which property of the DNA is proved by this experiment?

View Text Solution

11. Read carefully sequence of codons in the mRNA unit and answer the questions:

(a) What change is needed in the first codon to start the translation process?

(b) If translation starts by that change, till which codon it can continuous? Why?

View Text Solution

12. List two essential roles of ribosome during translation.

Watch Video Solution

13. Differentiate between template strand and coding strand.

Watch Video Solution

14. Decribe the structure of a nucleosome.

Watch Video Solution

15. Define nucleosome.

Watch Video Solution

16. List two essential roles of ribosome during translation.

Watch Video Solution

17. Examine the diagram of mRNA given below. Mark the 5’ and 3' ends of the mRNA by giving reasons.

View Text Solution

View Text Solution

18. What do you mean by central forces?

Watch Video Solution

19. What is genetic code? Give its two characteristics.

Watch Video Solution

20. Give three differences between DNA and RNA.

Watch Video Solution

21. Draw a neat diagrammatic structure of a molecular model of DNA proposed by Watson and Crick and label base pairs and deep groove.

Watch Video Solution

22. A double stranded DNA molecule has 20% of cytosine. Using Chargaff's law calculate the percentage of adenine in this DNA molecule?

Watch Video Solution

23. Certain molecular processes are given in column (A). Provide the terms given to these processes in column (B), after selecting them from the terms: Recombination, gene regulation, prokaryotic, transcription, eukaryotic transcription, translation, replication, gene transfer, DNA fingerprinting

View Text Solution

24. Read the sequence of the nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain.

Polypeptide : met-phe-met-proline-valine-serine AM:

(i) Provide the triplet of bases (codon) for (a) valine (b) proline

(ii) Write the nucleotide sequence of the DNA strand from which this mRNA Was transcribed

(iii) What does the last codon of this RNA stand for?

View Text Solution

25. (a) Expand hnRNA.

(b) Name the enzyme that transcribes it.

(c) It is a precursor. What does it form later?

Watch Video Solution

26. Given below is a sequence of steps of transcription in a eukaryotic cell.

Fill up the blanks (1, 2, 3, 4) left in the sequence.

View Text Solution

27. Draw a schematic diagram of a part of double stranded dinucleotide DNA chain having all the four nitrogenous bases and showing the correct polarity.

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28. Discuss in detail how RNA can be used to silence specific genes?

Hint: It can be done by process of RNA interference (RNA). It deals with cellular defense in eukaryotes. Here ds RNA binds to specific site in mRNA and silences it by checking its translation process.

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29. State the role of transposons in silencing of mRNA in eukaryotic cells.

Watch Video Solution

30. How are 'sticky ends' formed on a DNA strand? Why are they so called ?

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31. Differentiate between the genetic codes given below :

(a) Unambiguous and Universal

(b) Degenerate and Initiator :

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32. Following are the features of genetic codes. What does each one indicate?

Stop codon, Unambiguous codon, Degenerate codon, Universal codon.

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33. Why does the lac operon shut down some time after the addition of lactose in the medium where E.coil was growing ? Why low level expression of lac operon is always required ?

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Revision Exercises Short Answer Type Ii Questions

1. What is totipotency? How does it help in propagation?

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2. Differentiate between DNA polymerase and RNA polymerase?

Watch Video Solution

3. What is DNA fingerprinting? Explain its importance

Watch Video Solution

4. How did Hershey and Chase prove that DNA is the genetic material?

Watch Video Solution

5. Describe Meselson and Stahl's experiment to show that DNA replication is semiconsertive.

Watch Video Solution

6. Mention briefly the initiation phase of translation process.

Watch Video Solution

7. Write four essential requirements of genetic material?

Watch Video Solution

8. Write four salient features of Genetic Code.

Watch Video Solution

9. Why 'Human Genome Project' is called Mega Projects'?

Watch Video Solution

10. Write down significance of DNA fingerprinting.

Watch Video Solution

11. Explain the complementary gene with example.

Watch Video Solution

12. In an E. coli culture lactose is used as food instead of glucose. If so, answer the following questions:

(1) How do the bacteria respond to the above situation at genetic level?

(2) If lactose is removed from the medium what will happen?

Watch Video Solution

13. Describe the structure of Lac operon in brief.

Watch Video Solution

14. Owsald Avery and others have continued Griffith transforming principle to prove DNA as genetic material - subuntiate.

Watch Video Solution

15. (a) What are Okazaki segments?

(b) Differentiate between leading and lagging strands.

Watch Video Solution

16. Describe the lac operon in detail.

Watch Video Solution

17. List the raw materials and its functions involved in protein synthesis.

Watch Video Solution

18. The sailent feature of genetic code is

Watch Video Solution

19. DNA replication is:-

Watch Video Solution

20. Differentiate between prokaryotic DNA and eukaryotic DNA.

Watch Video Solution

21. With the help of Meselson and Stahl experiment prove that DNA mode of replication is semi-conservative type.

Watch Video Solution

22. Okazaki fragments are :

Watch Video Solution

23. DNA is the better genetic material than RNA. Justify the statement with three comparative reasons.

Watch Video Solution

24. What do you mean by intron and exon?

Watch Video Solution

25. Describe briefly the Griffith's experiment?

Watch Video Solution

26. 'DNA replication is said to be semiconservative.' Why? Describe the experimenal proof of Messelson and Stahl to show DNA replication is semiconservative.

Watch Video Solution

27. Describe in brief the steps of initiation phase of transcription.

Watch Video Solution

28. Write functions of mRNA, tRNA and rRNA.

Watch Video Solution

29. (a) Draw the structure of the intiiator tRNA adaptor molecule.

(b) Why is tRNA called an adaptor molecule ?

Watch Video Solution

30. Explain the dual function of AUG codon. Give the sequence of bases it is transcribed from and its anticodon.

Watch Video Solution

31. How is the translation of mRNA terminated ? Explain.

Watch Video Solution

32. What are Satellite DNA in a genome? Explain their role in DNA fingerprinting.

Watch Video Solution

33. A tRNA is charged with amino acid methionine :

(i) Name the process involved in the attachment

(ii) Point out the mRNA codon and anticodon on tRNA for this aminoacid

(iii) What is heterochromatin?

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34. In a series of experiments with Streptococcus and mice F. Griffith concluded that R-strain bacteria had been transformed. Explain.

Watch Video Solution

35. (i) Name the enzyme that catalyses the transcription of hnRNA.

(ii) Why does the hnRNA need to undergo changes ? List the changes hnRNA undergoes and where in the cell such changes take place.

Watch Video Solution

36. Unambiguous, universal and degenerate are some of the terms used for the genetic code. Explain the salient features of each one of them.

Watch Video Solution

37. (a) Why did Meselson and Stahl use ^{14}N and ^{15}N isotopes in the sources of nitrogen present in the culture medium in their experiment. Explain.

(b) Write the conclusion drawn by them from the experiment.

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38. In a maternity clinic, for some reasons the authorities are not able to hand over the two new-borns to their respective real parents. Name and describe the technique that you would suggest to sort out the matter.

Watch Video Solution

39. Explain the two factors responsible for conferring stability to double hilix structure of DNA.

Watch Video Solution

40. List the two methodologies which were involved in human genome project . Mention how they were used.

Explain YAC and mention what was it used for.

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41. Describe the roles of heat , primers and the bacterium Thermus aquaticus in the process of PCR.

Watch Video Solution

42. (a) Mention two events in which DNA is unzipped.

(b) Predict the consequences when both the template and the coding strands of a DNA segement participate in transcription process ?

Watch Video Solution

43. Explain the process of making heterogamous nuclear RNA (hn RNA) into a fully functional mRNA in eukaryotes. Where does this process occur in the cell?

Watch Video Solution

44. (a) Why did Hershey and Chase use radioactive ^{32}P and ^{35}S in their experiments? Explain.

(b) Following the experiments conducted by them, write what conclusion did they arrive at and how?

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45. A segment of DNA molecule comprises of 546 nucleotides. How many cytosine nucleotides would be present in it if the number of adenine nucleotides is 96?

Watch Video Solution

Revision Exercises Case Based Answer Type Questions

1. Write briefly about m RNA.

Watch Video Solution

2. Differentiate between DNA and RNA.

Watch Video Solution

3. Discuss the salient features of human genome.

Watch Video Solution

4. Describe the goals of HGP.

Watch Video Solution

5. The sailent feature of genetic code is

Watch Video Solution

Revision Exercises Long Answer Type Questions

1. (a) Define exon and intron.

(b) Draw the structure of t-RNA.

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2. Give an account of DNA replication.

Watch Video Solution

3. What is the genetic code? Who deciphered genetic code? Give the characteristics of genetic code.

Watch Video Solution

4. (a) Define transcription.

(b) Describe in brief the process of transcription.

Watch Video Solution

5. (a) Define replication.

(b) Give a brief account of DNA replication.

Watch Video Solution

6. Describe the transcription of RNA from DNA.

Watch Video Solution

7. Define operon. Describe the regulation of inducible system with the help of lac-operon.

Watch Video Solution

8. (a) Define transcription.

(b) Describe in brief process of transcription.

Watch Video Solution

9. Explain the lac-operon of E-coli with the help of schematic representation.

Watch Video Solution

10. What is 'semi- conservative' DNA replication ? How was it experimentally proved and by whom ?

Watch Video Solution

11. How did Griffiths and Avery show experimentally that DNA is the hereditary material?

Watch Video Solution

12. Give a brief account of DNA replication.

Watch Video Solution

13. (a) Define transcription.

(b) Describe in brief the process of transcription.

Watch Video Solution

14. A DNA sequence needed for coding a peptide is given below.

“CAAGTAAATTGAGGACTC”

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15. Describe the mechanism of translation with suitable diagrams.

Watch Video Solution

16. Explain lac operon with suitable diagram.

Watch Video Solution

17. What is DNA fingerprinting? Mention its application.

Watch Video Solution

18. What is translation? Describe different steps in translation.

Watch Video Solution

19. REGULATION OF GENE EXPRESSION

Watch Video Solution

20. Write experimental proof that DNA replicates semi-conservatively.

Watch Video Solution

21. How do m-RNA, t-RNA and ribosomes help in the process of translation ?

Watch Video Solution

22. Explain the process to transcription in prokaryotes .How is the process different in eukaryotes ?

Watch Video Solution

23. (a) Draw a labelled diagram of a "replicating fork" showing the polarity. Why does DNA replication occur within such forks .

(b) Name two enzymes involved in the process of DNA replication, along with their properties.

Watch Video Solution

24. Explain Hershey and Chase experiment to prove that DNA is the hereditary material in certain bacteriophage.

Watch Video Solution

25. Discuss the essential features of genetic code.

Watch Video Solution

26. Genetic material is DNA not protein. How did Griffith prove this?

Watch Video Solution

27. Explain the Lac Operon of E. coli with the help of schematic representation.

Watch Video Solution

28. Explain Lac operon with suitable diagrams.

Watch Video Solution

29. Who proved semi-conservative replication of DNA experimentally and how? Explain.

Watch Video Solution

30. Explain initiation, elongation and termination during transcription in bacterial cells.

Watch Video Solution

31. Who gave unequivocal experimental proof that DNA is the genetic material? Describe their experiment.

Watch Video Solution

32. State the aim and describe Messelson and Stahl's experiment.

Watch Video Solution

33. Describe Frederick Griffith's experiment on Streptococcus pneumoniae. Discuss the conclusion he arrived at.

Watch Video Solution

34. How did Hershey and Chase established that DNA is transferred from virus to bacteria? Explain.

Watch Video Solution

35. What do you mean by the term 'Genome'? Add a brief note on Human Genome Project and its significance.

Watch Video Solution

36. (a) Draw a labelled diagram of a "replicating fork" showing the polarity. Why does DNA replication occur within such forks .

(b) Name two enzymes involved in the process of DNA replication, along with their properties.

Watch Video Solution

37. Explain how Beadle and Tatum put forward the one gene one enzyme hypothesis.

Watch Video Solution

38. a) Explain the process of DNA replication with the help of a schematic diagram.

b) In which phase of the cell cycle does replication occur in Eukaryotes? What would happen if cell-division is not followed after DNA replication?

Watch Video Solution

39. Explain the functioning of lac operon system with the help of a diagram.

Watch Video Solution

40. State the points of difference between DNA and RNA.

Watch Video Solution

41. List the salient features of double helix structure of DNA.

Watch Video Solution

42. Describe the structure of transcription unit in detail.

Watch Video Solution

43. Given below is a part of the template strand of a structural gene

$$\overline{\text{TAC} \quad \text{CAT} \quad \text{TAG} \quad \text{GAT}}$$

(a) Write its transcribed mRNA strand with its polarity.

(b) Explain the mechanism involved in initiation of the transcription of this strand.

Watch Video Solution

44. Write three characteristics of genetic code.

Watch Video Solution

45. How did Hershey and Chase differentiate between DNA and protein in their experiment while proving that DNA is the genetic material?

Watch Video Solution

46. Name the genes that constitute an operon. How does lac operon get switched on in the presence of lactose?

Watch Video Solution

47. (a) Explain with the help of schematic representation the lac operon of E. coli.

(b) Mention the role of lactose in this operon.

Watch Video Solution

48. What is 'semi- conservative' DNA replication ? How was it experimentally proved and by whom ?

Watch Video Solution

49. One of the codons on mRNA is AUG. Draw the structure of tRNA adapter molecule for this codon. Explain the uniqueness of this tRNA?

Watch Video Solution

50. Given below is a part of the template strand of a structural gene

TAC CAT TAG GAT

(a) Write its transcribed mRNA strand with its polarity.

(b) Explain the mechanism involved in initiation of the transcription of this strand.

Watch Video Solution

51. Explain Hershey-Chase experiment. What was proved through this experiment ?

Watch Video Solution

52. How did Alfred Hershey and Martha Chase arrive at the conclusion that DNA is the genetic material?

Watch Video Solution

53. Name the scientists who proved experimentally that DNA is the genetic material. Describe their experiment.

Watch Video Solution

54. Describe Frederick Griffith's experiment on Streptococcus pneumoniae. Discuss the conclusion he arrived at.

Watch Video Solution

55. (a) Describe this process of synthesis of fully functional mRNA in a eukaryotic cell.

(b) How in tho proceu of mRNA synthesis different from that in prokaryotes?

Watch Video Solution

56. Describe with the help of labelled diagrammatic sketches the experiments conducted by Hershey and Chase. Write the inference drawn by them.

Watch Video Solution

57. (a) Write, what DNA replication refers to.

(b) State the properties of DNA replication model.

(c) List the three enzymes involved in the process along with their functions.

Watch Video Solution

58. Describe the structure of nucleic acid as proposed by Watson and Crick.

Watch Video Solution

59. Give an account of post transcriptional modifications of a eukaryotic mRNA.

Watch Video Solution

60. a) Write the conclusin drawn by Griffith at the end of his experiment with Streptococcus pneumoniae.

b) How did O.Avery, C.MacLeod and M. McCarty prove that DNA was the genetic material? Explain.

Watch Video Solution

61. a) Explain the process of DNA replication with the help of a schematic diagram.

b) In which phase of the cell cycle does replication occur in Eukaryotes? What would happen if cell-division is not followed after DNA replication?

Watch Video Solution

62. (a) Describe the various steps of Griffith's experiment that led to the conclusion of the 'Transforming Principle'.

(b) How did the chemical nature of the 'Transforming Principle' get established ?

Watch Video Solution

63. Describe how the lac operon operates, both in the presence and absence of an inducer in E. coli.

Watch Video Solution

64. How did Hershey and Chase ~tablish that DNA is transferred from virus to bacteria ?

Watch Video Solution

65. What is an 'Inducible Operon'? Explain the regulation of gene expression in prokaryotes with the help of 'Lac-Operon'.

Watch Video Solution

66. (a) Describe the structure and function of a t-RNA molecules . Why is it referred to as an adapter molecules ?

(b) Explain the process of splicing of hn - RNA in a eukaryotic cell.

Watch Video Solution

67. Write the different components of a lac - operon in E . Coli Explain its expression while in an 'open' state.

Watch Video Solution

68. Describe Meselson and Stahl's experiment that was carried in 1958 on E. Coli. Write the conclusion they arrived at after the experiment.

Watch Video Solution

69. (a) Describe the process of transcription in bacteria.

(b) Explain the processing the hnRNA needs to undergo before becoming functional mRNA in eukaryotes.

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70. "Use of heavy isotope of nitrogen by Meselson and Stahl demonstrated semi-conservative mode of replication of a DNA molecule." Explain how did they arrive at this conclusion.

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71. Explain the mechanism of translation that occurs in the ribosomes in a prokaryote.

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Competition File Objective Type Questions Multiple Choice Questions Mcqs

1. DNA nucleotides are attached by

A. Hydrogen bond

B. Covalent bond

C. van der waals, bond

D. Electrovalent bond

Answer: A

Watch Video Solution

2. DNA element with ability to change its position, is called :

A. Cistron

B. Transposon

C. Intron

D. Recon

Answer: B

Watch Video Solution

3. Formation of mRNA for DNA is

A. Translation

B. Transcription

C. Transformation

D. Transduction

Answer: B

Watch Video Solution

4. mRNA direct the building of proteins through a sequience of

A. Exons

B. Introns

C. Codons

D. Anticodons

Answer: C

Watch Video Solution

5. Beadle and Tatum showed that each kind of mutant bread mould they studied lacked a specific enzyme.Their experiments demonstrated that

A. Cells need specific enzymes in order to function

B. Genes are made up of DNA .

C. Enzymes are required to repair damage

D. Genes carry information for making proteins 7 spew

Answer: B

Watch Video Solution

6. Whose experiments cracked the DNA and discobered unequivocally that a genetic code is a "triplet" :-

A. Nirenberg and Mathaei

B. 'Hershey and Chase

C. Morgan and Sturtevant

D. Beadle and Tatum

Answer: A

Watch Video Solution

7. T.O.Diener discovered a:

A. Free infectious RNA

B. Free infectious DNA

C. Infectious protein

D. Bacteriophage

Answer: A

Watch Video Solution

8. Semiconservative replication of DNA was first demonstrated in

A. Drosophila melanogaster

B. Escherichia coli

C. Streptococcus pneumoniae

D. Salmonella typhimurium

Answer: B

Watch Video Solution

9. Removal of introns and joining the exons in a defined order in a transcription unit is

A. Splicing

B. Tailing

C. Transformation

D. Capping

Answer: A

Watch Video Solution

10. The coding segment of DNA is :

A. Exon

B. Replicon

C. Intron

D. Muton

Answer: A

 Watch Video Solution

11. Okazaki is known for his contribution to the understanding of

A. Transcription

B. Translation

C. DNA replication

D. Mutation

Answer: C

Watch Video Solution

12. The beginning of understanding genetic transformation in bacteria was made by:

A. Frederick Griffith

B. Hershey and Chase

C. Watson and Crick

D. T.H. Morgan

Answer: A

Watch Video Solution

13. Formation of peptide and glycosidic bonds involves

A. Hydration

B. Dehydration

C. Esterification

D. Acidification

Answer: B

Watch Video Solution

14. What will be the corect gene expression pathway

A. Gene-mRNA-transcription-translation-protein

B. Transcription-gene-translation-mRNA-protein

C. Gene-transcription-mRNA-translation-protein

D. Gene-translation-mRNA-transcription-protein

Answer: C

Watch Video Solution

15. The main aim of the human genome project is.....

A. To introduce new genes into humans

B. To identify and sequence all the genes present in human DNA

C. To develop better techniques for comparing two different human DNA samples

D. To remove disease causing genes from human DNA.

Answer: B

Watch Video Solution

16. DNA gyrase, the enzyme that participates in the process of DNA replication is a type of

A. DNA topoisomerase

B. Reverse transcriptase

C. DNA ligase

D. DNA polymerase

Answer: A

Watch Video Solution

17. Assertion: Synthesis of DNA takes place in the S. phase of interphase.

Reason: Every chromosme, during metaphase, has two chromatids.

A. Statement A is wrong and B is correct

B. Statement A is correct and B is wrong

C. Both the statements A and B are correct and A is the reason for B

D. Both the statements A and B are correct and A is not the reason for B.

Answer: C

Watch Video Solution

18. In genetic fingerprinting, the 'probe' refers to ....

A. A radioactively labelled single stranded DNA molecule

B. A radioactively labelled single stranded RNA molecule

C. A radioactively labelled double stranded RNA molecule

D. A radioactively labelled double stranded DNA molecule.

Answer: A

Watch Video Solution

19. In the lac operon system, beta-galactosidase is coded by

A. a-gene

B. i-gene

C. l-gene

D. z-gene

Answer: D

Watch Video Solution

20. The process of copying genetic information from one strand of DNA to RNA is termed as _____ .

A. Translation

B. Transamination

C. Replication

D. Transcription

Answer: D

Watch Video Solution

21. Consider the statements

(i) rRNA provides template for synthesis of proteins

(ii) tRNA brings amino acids and reads genetic code

(iii) RNA polymerase binds to promoter and initiates transcription

(iv) A segment of DNA coding for polypeptide is called intron

A. I and III are correct

B. I and II are correct

C. I, I and III are correct

D. II and Ill are correct

Answer: D

Watch Video Solution

22. During Meselson and Stahl' experiments, heavy DNA was distinguished from normal DNA by centrifugation in

A. CsOH gradient

B. $^{14}NH_4Cl$

C. $^{15}NH_4Cl$

D. CsCl gradient

Answer: D

Watch Video Solution

23. The process of removal of introns and joining of exons is called :

A. Capping

B. Tailing

C. Termination

D. Splicing

Answer: D

Watch Video Solution

24. In bacteria, the formation of peptide bond during translation is effected by

A. Lysozyme

B. Ribozyme

C. Nucleosome

D. Microsome

Answer: B

Watch Video Solution

25. Location or sites in the human DNA where single base DNA differences occurs are called:

A. Repetitive DNA

B. VNTR

C. SNP

D. SSCP

Answer: C

Watch Video Solution

26. The 3'-5' phosphodiester linkages inside a polynucleotide chain serve to join -

A. One DNA strand with the other DNA strand

B. One nucleoside with another nucleoside

C. One nucleotide with another nucleotide

D. One nitrogenous base with pentose sugar

Answer: C

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27. In transcription in eukaryotes, heterogenous nuclear RNA (hnRNA)is transcribed by

A. RNA polymerase I

B. RNA polymerase Il

C. RNA polymerase III

D. All of these

Answer: B

Watch Video Solution

28. Non-proteinaceous enzyme that acts as a catalyst for the formation of peptide bond is

Or

"All enzymes are proteins." This statement is now modified because an apparent exception to this biological truth is

A. Spliceosome

B. Ribozyme

C. RNA poly I

D. RNA poly III

Answer: B

Watch Video Solution

29. In lac operon i gene codes for :

A. Inducer of lac operon

B. Repressor of lac operon

C. Hydrolysis of disaccharide

D. Permease

Answer: B

Watch Video Solution

30. Which one of the following have dual function ? It codes for methionine and acts as initiator codon

A. AUG

B. AUC

C. ACU

D. ACA

Answer: A

Watch Video Solution

31. Menthyl guanosine triphosphate is added to the 5' end of hnRNA in a process of

A. Splicing

B. Capping

C. Tailing

D. None of these

Answer: B

Watch Video Solution

32. A typical nucleosome contains :

A. 100 bp of DNA helix

B. 200 bp of DNA helix

C. 300 bp of DNA helix

D. 400 bp of DNA helix

Answer: B

Watch Video Solution

33. In the clotting mechanism pathway , thrombin activates factors

A. XI, Vlll, V

B. XI, IX, X

C. Vlll, X, V

D. IX, Vlll, X

Answer: A

Watch Video Solution

34. House-keeping proteins occur in

A. Endoplasmic reticulum

B. Golgi complex

C. Cytoskeleton

D. All of the above

Answer: D

Watch Video Solution

35. Which of the following statement about colour blindness is correct

A. 2% men are red colour blind, 6% are green colour blind

B. 6% men are red colour blind, 2% are green colour blind

C. 10% men are red colour blind, 5% are green colour blind

D. 5% men are red colour blind, 10% are green colour blind

Answer: A

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36. A mixture containing DNA fragments A,B,C and D, with molecular weights of $A + B = C$, $A > B$ and $D > C$, was subjected to agarose

gel electrophoresis. The positions of these fragments from cathode to anode sides of the gel would be

A. B, A, C, D

B. A, B,C, D

C. C,B,A,D

D. B,A,D,C

Answer: B

Watch Video Solution

37. Which of the following DNA sequence qualifies to be designted as a palindrome ?

A. 5'- GACCAG - 3' in one strand

B. 3' GACCAG - 5' in one strand

C. 5'- GACGAG - 3'

3' - CTGGTC - 5'

D. 5 - AGCGCT - 3'

3' - TCGCGA - 5'

Answer: D

Watch Video Solution

38. If the total amount of adenine and thymine in a double stranded DNA is 45% the amount of guanine this DNA will be :

A. 0.225

B. 0.275

C. 0.45

D. 0.55

Answer: B

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39. RNA polymerase II is responsible for transcription of :

A. rRNA

B. hnRNA

C. tRNA

D. snRNA

Answer: B

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40. Which of the following sequences will be produced as a result of transcription of the DNA sequence - CGATTACAG

A. GCUAAUGUC

B. CGUAAUCUG

C. GCTAATGTC

D. GCUAATCTG

Answer: A

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41. Transposons are

A. House-keeping genes

B. Jumping genes

C. Transporting genes

D. Stationary genes

Answer: B

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42. Purine possess nitrogen at

A. 1,2, 4 and 6 position

B. 1, 3, 5 and 7 position

C. 1,3, 7 and 9 position

D. 1,2,6and8 position

Answer: C

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43. Test cross is a cross between:

A. Hybrid X dominant parent

B. Hybrid X recessive parent

C. Hybrid X hybrid parent

D. Two distantly related species

Answer: A

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44. In a DNA molecule distance between two bases is

A. $2n\frac{m}{20}\text{Å}$

B. $0.2n\frac{m}{2}\text{Å}$

C. $3.4n\frac{m}{34}\text{Å}$

D. $0.34n\frac{m}{3.4}\text{Å}$

Answer: D

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45. Semiconservative model of DNA replication was proposed by which workers in eukaryotes

A. Hershey and Chase

B. Griffith

C. Watson and Crick

D. Meselson and Stahl

Answer: D

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46. The enzyme needed in biological system for joining two molecules is called

A. Lyases

B. Diastases

C. Polymerase

D. Hydrolase

Answer: C

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47. Which of the following is structural subunit of DNA ?

A. Protein

B. Carbohydrate

C. RNA

D. Nucleotides

Answer: D

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48. Nitrogenous bases present in DNA

A. Adenine, guanine, cytosine, thymine

B. Adenine, guanine, cytosine, uracil

C. Adenine, thymine, uracil

D. Guanine, uracil

Answer: A

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49. DNA replication occurs during which part of cell cycle?

A. G, phase

B. S-phase

C. G, phase

D. Dividing phase

Answer: B

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50. Which is not found in RNA?

A. Thymine

B. Uracil

C. Guanine

D. Cytosine

Answer: A

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51. Hargovind Khorana is known for

A. Discovery of DNA structure

B. Synthesis of protein

C. Discovery of DNA ligase enzyme

D. Discovery of tRNA

Answer: B

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52. The lac operon consists of

A. Four regulatory genes only

B. One regulatory gene and three structural genes

C. Two regulatory genes and two structural genes

D. Three regulatory genes and three structural genes

Answer: D

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53. The unequivocal proof of DNA as the genetic material came from the studies on a

A. Virioid

B. Bacterial virus

C. Bacterium

D. Fungus

Answer: B

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54. Given below is a sample of a portion of DNA strand giving the base sequence on the opposite strands. What is so special shown in it

5'_____GAATTC_____3'

3'_____CTTAAG_____5'

A. Replication completed

B. Deletion mutation

C. Start codon at the 5' end

D. Palindromic sequence of base pairs

Answer: D

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55. The double helical model of the DNA was proposed by Watson and Crick based on what data produced by wilkins and Franklin

A. Hybridization

B. DNA sequencing

C. Southern blotling

D. X-ray diffraction

Answer: D

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56. The pyrimidine base which confers additional stability to DNA over RNA is :

A. Adenine

B. Guanine

C. Cytosine

D. Thymine

Answer: D

Watch Video Solution

57. Methyl guanosine triphosphate is associated with :

A. Point mutation

B. Tautomerism

C. Tailing

D. Okazaki fragments

Answer: C

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58. Which one the following statements are correct ?

(i) RNA polymerase I transcribes rRNAs

(ii) RNA polymerase II transcribes snRNAs

(iii) RNA polymerase III transcribes hnRNA

(iv) RNA polymerase II transcribes hnRNA

A. (i) and (ii) are correct

B. (i) and (iii) are correct

C. (i), (ii) and (iv) are correct

D. (i) and (iv) are correct

Answer: D

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59. In Hershey and Chase experiments , radioactive $.^{32}P$ was used to culture bacteriophages which resulted in radioactive :

A. Viral DNA

B. Bacterial capsule

C. Viral proteins

D. Plasma membrane of bacteria

Answer: A

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60. The inducer for switching 'on' the lac operon in bacteria is

A. Presence of lactose

B. Number of bacteria

C. Presence of structural genes in the bacteria

D. Presence of sucrose

Answer: A

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61. Select the incorrect statement (s) :

1. Six codons do not code for any amino acid.

2. Codon is read in m-RNA in a contiguous fashion.

3. Three codons function as stop codons.

4. The initiator codon AUG codes for methionine

A. 1, 2 and 4 are incorrect

B. 1, 2 and 3 are incorrect

C. 2, 3 and 4 are incorrect

D. 1 alone is incorrect

Answer: D

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62. The haploid content of human DNA is

A. $3.3x10^6$ bp

B. $3.3x10^9$ bp

C. $4.6x10^6$ bp

D. $6.6x10^9$ bp

Answer: B

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63. During transcription, DNA site at which RNA polymerase binds is called

A. Promoter

B. Regulator

C. Receptor

D. Enhancer

Answer: A

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64. In a double stranded DNA molecule , the percentage of cytosine is 18. What would be the percentage of adenine ?

A. 0.32

B. 0.64

C. 0.36

D. 0.18

Answer: A

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65. DNA contains nucleobases, sugar and phosphate. Removal of which among these from a DNA sample will not significantly affect the length of DNA?

A. Nucleobases

B. Sugar

C. Phosphate

D. None of these

Answer: A

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66. The number of codons that code different amino acids is

A. 16

B. 31

C. 61

D. 64

Answer: C

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67. Some amino acids are coded by more than one codon

A. Unambiguous

B. Degenerate

C. Universal

D. Initiator

Answer: B

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68. Out of 64 codons, the number of codons with GGGis

A. 1

B. 2

C. 4

D. 6

Answer: A

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69. The genetic material of a virioid is :

A. DNA

B. RNA

C. Protein

D. Carbohydrate

Answer: B

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70. Which among the following codons not have t-RNAs ?

A. Start codon

B. AUG

C. GGG

D. Stop codon

Answer: D

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71. In lac operon , the genes a, I, y and z code respectively for

A. Repressor protein, permease, β-galactosidase, transacetylase

B. Transacetylase, permease, β-galactosidase, repressor protein

C. Permease, transacetylase, repressor protein, β-galactosidase

D. Transacetylase, repressor protein, permease, β-galactosidase

Answer: D

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72. In humans most number of genes are located on chromosome

A. 1

B. 6

C. X

D. 21

Answer: A

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73. The codon which has dual function is

Or polypeptide synthesis in prokaryotes is initiated by

A. UGA

B. UUU

C. AUG

D. AAA

Answer: C

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74. The enzyme required to catayze the polymerzatio of deoxynucleotides is

A. DNA ligase

B. DNA polymerase

C. β-galactosidase

D. Transacetylase

Answer: B

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75. To which of the following factors, RNA polymerase binds transiently to initiate transcription

A. rho

B. beta

C. gamma

D. sigma

Answer: D

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76. Read the following statements and choose the correct option.

A. Nitrogenous base is linked to the pentose sugar through a N-glycosidic linkage.

B. Phosphate group is linked to 5'-OH of a nucleoside through phosphoester linkage.

C. Two nucleosides are linked through 3'-5' N- glycosidic linkage.

D. Negatively charged DNA is wrapped around positively charged histone octamer to form nucleosome.

A. A, B and C alone are wrong

B. D alone is wrong

C. C and E alone are wrong

D. A alone is wrong

Answer: C

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77. Select the correct statement regarding protein synthesis :

A. When the small subunit of the ribosome encounters an mRNA the process of translation begins.

B. Peptidase catalyse the formation of peptide bond.

C. UTRs are present between the start codon and stop codon.

D. At the end of translation the release factor binds to the initiation codon.

Answer: A

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78. The enzyme (s) responsible for the transcription of snRNA in eukaryotes is/are

A. RNA polymerase I

B. RNA polymerase I and Il

C. RNA polymerase II

D. RNA polymerase Ill

Answer: D

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79. The pressence and position of which one of the followihng defines the template and coding strands in a trasncription unit

A. Repressor

B. Operator

C. Structural gene

D. Promoter

Answer: D

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80. which of the following is the correct sequence of units os genetics arranged in desending order corred of size?

A. Gene $\rightarrow$ Cistron $\rightarrow$ Muton $\rightarrow$ Recon

B. Gene $\rightarrow$ Muton $\rightarrow$ Cistron $\rightarrow$ Recon

C. Gene $\rightarrow$ Recon $\rightarrow$ Cistron $\rightarrow$ Muton

D. Gene $\rightarrow$ Cistron $\rightarrow$ Recon $\rightarrow$ Muton

Answer: D

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81. DNA fragments generated by the restriction endonucleases in a chemical reaction can be separated by

A. Polymerase chain reaction

B. Electrophoresis

C. Restriction mapping

D. Centrifugation

Answer: B

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82. If a radiolabel is used to tag a DNA molecule, the technique used to localise would be:

A. X-ray crystallography

B. Autoradiography

C. Fluorescence microscopy

D. Electron microscop

Answer: B

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83. The synthesis of DNA is discontinuous on one strand of the replication fork because:

A. DNA molecule being synthesised is very long

B. DNA-dependent DNA polymerase catalyse polymerisation only in one direction (5' $\rightarrow$ 3')

C. It is more efficient process

D. It help to use DNA ligase

Answer: B

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84. The double helix of DNA is made of polynucleotide chains where backbone constituted by sugar-phosphate and bases are projected :

A. Inside

B. Outside

C. One base inside and other outside

D. Bases remain in line of sugar phosphate

Answer: A

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85. Among the RNA polymerases, the RNA polymerase-II transcribes:

A. r-RNA

B. t-RNA

C. Small nuclear RNAs

D. Heterogenous nuclear RNA

Answer: D

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86. Select the correct option

	Direction of RNA synthesis	Direction of reading of the template DNA strand
(a)	5' – 3'	5' – 3'
(b)	3' – 5'	3' – 5'
(c)	5' – 3'	3' – 5'
(d)	3' – 5'	5' – 3'

A.

Direction of RNA synthesis strand	Direction of the template DNA
$5' - 3'$	$3' - 5'$

B.

Direction of RNA synthesis strand	Direction of the template DNA
$3' - 5'$	$5' - 3'$

C.

Direction of RNA synthesis strand	Direction of the template DNA
$5' - 3'$	$5' - 3'$

D.

Direction of RNA synthesis strand	Direction of the template DNA
$3' - 5'$	$3' - 5'$

Answer: A

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87. Which one of the following is wrongly matched?

A. Transcription-Writing information from DNA to t-RNA

B. Translation-using information in m-RNA to make protein

C. Repressor protein-Binds to operator to stop enzyme synthesis

D. Operon-Structural genes, operator and promoter

Answer: D

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88. Transformation was discovered by

A. Meselson and Stahl

B. Hershey and Chase

C. Griffith

D. Watson and Crick

Answer: C

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89. Identify the palindromic sequence in the following

A. 5'-GAATTC-3'

3'-CTTAAG-5'

B. 5'-ATCG'-3'

3'-TAGC-5'

C. 5'-AAAAA-3'

3'-TTTTT-5'

D. 5'-CCCCC-3'

3'-GGGGC-5'

Answer: A

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90. The process of transfer of genetic information is :

A. Transversion

B. Transcription

C. inversion

D. Translocation

Answer: B

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91. Reverse transcriptase is

A. RNA dependent RNA polymerase

B. DNA dependent RNA polymerase

C. DNA dependent DNA polymerase

D. RNA dependent DNA polymerase

Answer: D

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92. In griffith's experiment, the conversion of R-type to S-type of Diplococcus pneumoniae when mixed with heat killed S-type is called

Or

The uptake of naked DNA by bacteria is called

A. Mutation

B. Transduction

C. Transfection

D. Transformation

Answer: D

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93. In processing of eukaryotic hn-RNA, during protein synthesis tailing involves _ _ _ _ of RNA:

A. Addition of adenylate residues at 3' end

B. Addition of methyl guanosine triphosphate at 3' end

C. Addition of methyl guanosine triphosphate at 5' end

D. Removal of introns

Answer: A

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94. The cloning vectors M13 has genetic material

A. ss RNA

B. ds RNA

C. ss DNA

D. ds DNA

Answer: B

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95. During DNA replication, the addition of nucleotides on the lagging strand occurs

A. Towards the replication fork

B. At a faster rate than leading strand.

C. Continuously

D. Discontinuously

Answer: D

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96. The technique of produing large number of genetically similar plants within short time by tissue culture is called :

A. Organogenesis

B. Somatic hybridization

C. Micropropagation

D. Protoplast culture

Answer: C

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97. Transposons are sequnces of :

A. DNA

B. mRNA

C. rRNA

D. tRNA

Answer: A

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98. Which of the following is correct pair of pyrimidine bases

A. Adenine and thymine

B. Adenine and guanine

C. Thymine and Cytosine

D. Guanine and Cytosine

Answer: C

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99. The Human Genome Project (HGP) was initiated in

A. 1988

B. 1990

C. 1992

D. 1994

Answer: B

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100. Sequence of amino acids in a polypeptide is determined by

A. Genetic code

B. m-RNA

C. tRNA

D. rRNA

Answer: A

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101. RNA polymerase -1 transcribes eukaryotic ribosome which does not consists of :

A. 5.8 S rRNA

B. 28 S rRNA

C. 18 S rRNA

D. 5 S rRNA

Answer: D

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102. Match the following:

(A) VNTR ---- p. Largest gene

(B) Introns and Exons --- q. DNA fingerprinting

(C) Dystrophin --- r. Bulk DNA

(D) Satellite DNA --- s. Splicing

A. (A) - r, (B) -s, (C)- p, (D)- q

B. (A)- q, (B) - s, (C)- p, (D)-r

C. (A) - q, (B)- p, (C) - s, (D)-r

D. (A)- s, (B)-p, (C)-q,(D)-r

Answer: B

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103. Which of the following enzyme is used to join DNA fragments :

A. DNA polymerase

B. Ligase

C. Primase

D. Endonuclease

Answer: B

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104. DNA duplication takes place during :

A. S-phase

B. G_2 phase

C. G_1 phase

D. Prophase

Answer: A

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105. Satellite DNA is important because it

A. Does not code for proteins and is the same in all members of the population

B. Codes for enzymes needed for DNA replication

C. Codes for proteins needed in cell cycle

D. Shows high degree of polymorphism in population and also the same degree of polymorphism in an individual, which is heritable

from parents to children.

Answer: D

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106. Which one of the following is not applicable to RNA ?

A. Heterocyclic nitrogenous bases

B. Chargaff's rule

C. Complementary base pairs

D. 5' Phosphoryl and 3' hydroxyl ends

Answer: B

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107. Which of the following statement is wrong for viroids?

A. They lack a protein coat

B. They are smaller than viruses

C. They cause infection

D. Their RNA is of high molecular weight

Answer: D

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108. Which of the following is required as inducer(s) for the expression of Lac operon

A. Glucose

B. Galactose

C. Lactose

D. Lactose and galactose

Answer: C

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109. A complex of ribosomes attached to a single strand of RNA is known as

A. Polysome

B. Polymer

C. Polypeptides

D. Okazaki fragments

Answer: A

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110. Which of the following is not required for any of the techniques of DNA fingerprinting available at present

A. Polymerase chain reaction

B. Zinc finger analysis

C. Restriction enzymes

D. DNA-DNA hybridization

Answer: B

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111. Which one of the following is the starter codon ?

A. AUG

B. UGA

C. UAA

D. UAG

Answer: D

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112. The amino acid trytophan is the precursor for the synthesis of

A. Melatonin and Serotonin

B. Thyroxine and Triiodothyronine

C. Estranger and Progesterone

D. Cortisol and cortisone

Answer: D

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113. Which one of the following statements is wrong:

A. Sucrose is a disaccharide

B. Cellulose is a polysaccharide

C. Uracil is a pyrimidine

D. Glycine is a sulphur containing amino, acid

Answer: D

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114. The equivalent of a structural gene is

A. Operon

B. Recon

C. Muton

D. Cistron

Answer: D

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115. Which of the following rRNAs acts as structural RNA as well as ribozyme is bacteria?

A. 23 SrRNA

B. 5.8 SrRNA

C. 5SrRNA

D. 18 SrRNA

Answer: A

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116. A non-proteinaceous enzyme is

A. Ligase

B. Deoxyribonuclease

C. Lysozyme

D. Ribozyme

Answer: D

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117. A molecule that can act as a genetic material must fulfill the traits given below, except

A. It should be unstable structurally and chemically

B. It should provide the scope for slow changes that are required for evolution

C. It should be able to express itself in the form of 'Mendelian characters'

D. It should be able to generate its replica

Answer: A

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118. DNA-dependent RNA polymerase catalyzes transcription on one strand of the DNA which is called the

A. Alpha strand

B. Antistrand

C. Template strand

D. Coding strand

Answer: C

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119. The association of histone H1 with a nucleosome indicattes

A. DNA replication is occuring

B. The DNA is condensed into a chromatin fibre

C. The DNA double helix is exposed

D. Transcription is occuring

Answer: B

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120. DNA replication in bacteria occurs

A. Within nucleolus

B. Prior to fission

C. Just before transcription

D. During S phase

Answer: B

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121. The final proof for DNA as the genetic material came from the experiments of

A. Hershey and Chase

B. Avery, MaCleod and McCarty

C. Har Gobind Khorana

D. Griffith

Answer: A

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122. Viroids differ from viruses in having

A. DNA molecules without protein coat

B. RNA molecule with protein coat

C. RNA molecule without protein coat

D. DNA molecule with protein coat

Answer: C

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123. DNA fragments are

A. Negatively charged

B. Neutral

C. Either positively or negatively charged depending on their size

D. Positively charged

Answer: A

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124. The experimental proof for semiconservative replication of DNA was first shown in a

A. Bacterium

B. Plant

C. Fungus

D. Virus

Answer: A

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125. Select the correct match

A. Alfred Hershey and Martha Chase - TMV

B. Matthew Meselson and F. Stahl - Pisum sativum

C. Alec. Jeffreys - Streptococcus pneumoniae

D. Francois Jacob and Jacques Monod - Lac Operon

Answer: D

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126. All of the following are parts of an operon except

A. Structural genes

B. An enhancer

C. An operator

D. A promoter

Answer: B

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127. AGGTATCGCAT is a sequence from the coding strand of a gene. What will be' the corresponding sequence of the transcribed mRNA?

A. UGGTUTCGCAT

B. ACCUAUGCGAU

C. AGGUAUCGCAU

D. UCCAUAGCGUA

Answer: D

Watch Video Solution

128. Purines found both in DNA and RNA are

A. Adenine and thymine

B. Adenine and guanine

C. Guanine and cytosine

D. Cytosine and thymine

Answer: B

Watch Video Solution

129. Which of the following glucose transporters insulin-dependent?

A. GLUT I

B. GLUT II

C. GLUT III

D. GLUT IV

Answer: D

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130. Under which of the following conditions there will be no change in the reading frame of following mRNA?

5'AACAGCGGUGCUAUU 3'

A. Insertion of G at 5^{th} position

B. Deletion of G from 5^{th} position

C. Insertion of A at G at 4^{th} and 5^{th} positions respectively

D. Deletion of GGU from 7^{th}, 8^{th} and 9^{th} positions

Answer: D

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131. What map unit (Centimorgan) is adopted in the construction of genetic maps?

A. A unit of distance between two expressed genes, representing 10% cross over

B. A unit of distance between two expressed genes, representing 100% cross over

C. A unit of distance between genes on chromosomes, representing 1% cross over

D. A unit of distance between genes on chromosomes, representing 50% cross over

Answer: C

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132. Expressed Sequence Tags (ESfs) refers to :

A. Genes expressed as RNA

B. Polypeptide expression

C. DNA polymorphism

D. Novel DNA sequences

Answer: A

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133. Which of the following pair of oragnelles does not contain DNA?

A. Mitochondria and Lysosomes

B. Chloroplast and Vacuoles

C. Lysosomes and Vacuoles

D. Nuclear envelope and Mitochondria

Answer: D

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134. What is the genetic disorder in which an indi vidual has an overall masculine development, gynaecomastia, and is sterile?

A. Turner's syndrome

B. Klinefelter's syndrome

C. Edward syndrome

D. Down's syndrome

Answer: B

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135. Variations caused by mutation, as proposed by Hugo de Vries, are:

A. random and directional

B. random and directionless

C. small and directional

D. small and directionless

Answer: B

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Competition File Objective Type Questions Match Type Questions

1. Match the terms in Column A with suitable terms in Column B :

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2. Match the items in Column A with those of Column B :

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1. Assertion. Genetic code shows code in mRNA not in DNA.

Reason. DNA is present inside the nucleus and code is read from mRNA inside the cell.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: A

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2. Assertion. DNA molecule acts as a template for synthesis of both RNA and DNA.

Reason. DNA duplex has the feature of right handed coiling and antiparallel.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: B

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3. Assertion. DNA replication needs RNA primer.

Reason. DNA polymerase enzyme can make a DNA chain longer but cannot initiate its synthesis.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: C

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4. Assertion. The first codon discovered by Nirenberg and Matthaei was UUU.

Reason. Genetic code translates the language of protein into that of RNA.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: D

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5. Assertion. An amino acid in polypeptide chain is not altered due to change in third base of codon.

Reason. It is due to Wobble hypothesis.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: A

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6. Assertion. Replication of DNA is accurate.

Reason. Errors in DNA will spoil the genome.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: C

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7. Assertion. One of the property of genetic code is degeneracy.

Reason. Many amino acids can be coded by more than one codon.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: A

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8. Assertion. Temin modified Crick's 'central dogma' to 'central dogma reverse.'

Reason. Crick was of the view that flow of genetic information in cells is bidirectional.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: C

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9. Assertion. Guanine cannot pair with cytosine.

Reason. Guanine and cytosine do not have perfect matching.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: D

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10. Assertion. The DNA contents are usually constant in a given species.

Reason. DNA replication is of continuous type.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: C

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11. Assertion. Plasmids are being widely used as vehicle DNA.

Reason. They can be easily isolated and introduced viral genome.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: A

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12. Assertion. Constitutive genes are also known as house keeping genes Reason. Constitutive genes fail to express, as their products are not required for essential normal activities.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: C

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13. Assertion. Few of repetitive sequences are called as jumping genes.

Reason. They jump at place of location and do not change their position.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: C

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14. Assertion. When tryptophan is present the repressor is unable to bind to the operator.

Reason. Transcription of structural genes occurs.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: D

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15. Assertion. The ability of certain DNA sequence in the genome to move from one site to another, without any sequence relationship is called transposition

Reason. The message from nuclear DNA for the synthesis of specific cytoplasmic protein is carried by m-RNA

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: B

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16. Assertion (A) : Replication and transcription occur in the nucleus but translation occurs in the cytoplasm.

Reason (R) : m-RNA is transferred from the nucleus into the cytoplasm where ribosomes and amino acids are available for protein synthesis.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: A

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17. Consider the following statements :

Assertion (A) : Amber codon is a termination codon .

Reason (R) : If in a m-RNA, a termination codon is present, the protein synthesis stops abruptly whether the protein synthesis is complete or not.

Now select you answer from code given below :

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: A

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18. Assertion (A) : Replication and transcription occur in the nucleus but translation occurs in the cytoplasm.

Reason (R) : m-RNA is transferred from the nucleus into the cytoplasm where ribosomes and amino acids are available for protein synthesis.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanations of the Assertion

C. If Assertion is true but the Reason is false .

D. If both Assertion and Reason are false.

Answer: A

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Chapter Practice Test Section A

1. During DNA replication in prokaryotes DNA is anchored to :

A. Chromosome

B. Mesosome

C. Nucleolus

D. Ribosome

Answer:

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2. One gene-one enzyme hypothesis of Beadle and Tatum was experimentally proved on:

A. Saccharomyces

B. Neurospora crassa

C. Lathyrus odoratus

D. Claviceps

Answer:

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3. DNA element with ability to change its position, is called :

A. Cistron

B. Transposon

C. Intron

D. Recon

Answer:

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4. Initiation codon is :

A. UUU

B. UGA

C. AUG

D. VAG

Answer:

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5. Out of 64 codons, only 61 codes for the 20 different amino acids, this character of genetic code is called

A. Degeneracy

B. Non-ambiguous nature

C. Redundancy

D. Overlapping

Answer:

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6. Which one is referred to as soluble RNA ?

A. mRNA

B. tRNA

C. rRNA

D. ssRNA

Answer:

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Chapter Practice Test Section B

1. Name any three viruses which have RNA as the genetic material.

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2. What is DNA polymorphism? What is it important to study it?

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3. What is transversion ?

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4. What do you mean by "genetic code is universal" ?

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5. Write any two aims of bioinformatics.

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Chapter Practice Test Section C

1. What is Wobble hypothesis ? .

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2. Would it be appropriate to use DNA probes such as VNTR in DNA fingerprinting of a bacteriophage?

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3. Differentiate between prokaryotic DNA and eukaryotic DNA.

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4. Discuss the gene concept briefly.

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Chapter Practice Test Section E

1. Give an brief account of DNA replication.

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